

What is claimed is:

Sub B1 > 1. Isolated nucleic acid comprising DNA having at least an 80% sequence identity to (a) a DNA molecule encoding a hSu(fu) polypeptide having the sequence of amino acid residues from 1 to 433 of Figure 1 (SEQ ID NO:2), or (b) the complement of the DNA molecule of (a).

5 2. The isolated nucleic acid molecule of Claim 1 comprising the sequence of nucleotide positions from about 74 to about 1372 of Figures 6A-6B (SEQ ID NO:1).

3. The isolated nucleic acid molecule of Claim 1 comprising the sequence of Figures 6A-6B (SEQ ID NO:1).

Sub B2 > 4. An isolated nucleic acid molecule encoding a hSu(fu) polypeptide, comprising DNA hybridizing to the complement of the nucleic acid having the sequence of nucleotide positions from about 74 to about 1372 of Figures 6A-6B (SEQ ID NO:1).

5. An isolated nucleic acid molecule comprising DNA having at least an 80% sequence identity to (a) a DNA molecule encoding the same mature polypeptide encoded by the human protein cDNA in ATCC Deposit No. PTA-127 (DNA33455-1548), or (b) the complement of the DNA molecule of (a).

15 6. The isolated nucleic acid molecule of Claim 5 comprising DNA encoding the same mature polypeptide encoded by the human protein cDNA in ATCC Deposit No. PTA-127 (DNA33455-1548).

7. An isolated nucleic acid molecule comprising (a) DNA encoding a polypeptide having at least an 80% sequence identity to the sequence of amino acid residues from about 1 to about 433 of Figure 1 (SEQ ID NO:2), or (b) the complement of the DNA of (a).

20 8. The isolated nucleic acid molecule of Claim 7 comprising (a) DNA encoding a polypeptide having the sequence of amino acid residues from 1 to about 433 of Figure 1 (SEQ ID NO:2), or (b) the complement of the DNA of (a).

9. An isolated nucleic acid molecule comprising (a) DNA encoding a polypeptide scoring at least 80% positives when compared to the sequence of amino acid residues from 1 to about 433 of Figure 1 (SEQ ID NO:2), or (b) the complement of the DNA of (a).

Sub B3 > 10. An isolated nucleic acid molecule having at least 100 nucleotides and produced by hybridizing a test DNA molecule under stringent conditions with (a) a DNA molecule encoding a hSu(fu) polypeptide having the sequence of amino acid residues from 1 to about 433 of Figure 1 (SEQ ID NO:2), or (b) the complement of the DNA molecule of (a), and, if the test DNA molecule has at least about an 80 % sequence identity to (a) or (b), isolating the test DNA molecule.

Sub C5 > 11. A vector comprising the nucleic acid of Claim 1

12. The vector of Claim 11 operably linked to control sequences recognized by a host cell transformed with the vector.

13. A host cell comprising the vector of Claim 12.

35 14. The host cell of Claim 13, wherein said cell is a CHO cell.



15. The host cell of Claim 13, wherein said cell is an E. coli.

16. The host cell of Claim 13, wherein said cell is a yeast cell.

Sub D3 > 17. A process for producing a hSu(fu) polypeptide comprising culturing the host cell of Claim 12 under conditions suitable for expression of said hSu(fu) polypeptide and recovering said hSu(fu) polypeptide from the cell culture.

40 18. An isolated hSu(fu) polypeptide encoded by the DNA of Claim 1.

- Sub B4 19. An iso Su(fu) polypeptide comprising a polypeptide having at least an 80% sequence identity to the sequence of amino acid residues from 1 to about 433 of Figure 2 (SEQ ID NO:2).
20. The isolated polypeptide of Claim 19 comprising amino acid residues from 1 to about 433 of Figure 2 (SEQ ID NO:2).
- 5 21. An isolated hSu(fu) polypeptide scoring at least 80% positives when compared to the sequence of amino acid residues from 1 to about 433 of Figure 1 (SEQ ID NO:2).
- Sub B5 22. An isolated hSu(fu) polypeptide comprising the sequence of amino acid residues from 1 to about 433 of Figure 1 (SEQ ID NO:2), or a fragment thereof sufficient to provide a binding site for an anti-hSu(fu) antibody.
- 10 23. An isolated hSu(fu) polypeptide encoded by the cDNA insert of the vector deposited as ATCC Deposit No. PTA-127 (DNA33455-1548).
- Sub B6 24. An isolated polypeptide produced by (i) hybridizing a test DNA molecule under stringent conditions with (a) a DNA molecule encoding a hSu(fu) polypeptide having the sequence of amino acid residues from 1 to about 433 of Figure 1 (SEQ ID NO:2), or (b) the complement of the DNA molecule of (a), and, if said test DNA molecule
- 15 has at least about an 80% sequence identity to (a) or (b), (ii) culturing a host cell comprising said test DNA molecule under conditions suitable for the expression of said polypeptide, and (iii) recovering said polypeptide from the cell culture.
25. A chimeric molecule comprising a hSu(fu) polypeptide fused to a heterologous amino acid sequence.
- 20 26. The chimeric molecule of Claim 25, wherein said heterologous amino acid sequence is an epitope tag sequence.
27. The chimeric molecule of Claim 25, wherein said heterologous amino acid sequence is a Fc region of an immunoglobulin.
28. An antibody which specifically binds to a hSu(fu) polypeptide.
- 25 29. The antibody of Claim 28, wherein said antibody is a monoclonal antibody.
30. The antibody of Claim 28, wherein said antibody is a humanized antibody.
31. An antagonist of a hSu(fu) polypeptide.
32. The antagonist of Claim 31 which is a small bioorganic molecule.
33. The antagonist of Claim 31 which is an antisense nucleotide.
- 30 34. An agonist of vertebrate hSu(fu) which stimulates or enhances the normal functioning of hSu(fu) in the Hh signaling pathway.
35. The agonist of Claim 34 which is a small bioorganic molecule.
36. A method of screening for antagonists or agonists of hSu(fu) biological activity comprising:
- 35 (a) exposing the hSu(fu) expressing target cells in culture to a candidate compound; and
- (b) scoring phenotypic or functional changes in treated cells;
- and comparing the results to control cells which were not exposed to the candidate compound.
37. A method of diagnosing to determine whether a particular disorder is modulated by hedgehog signaling, comprising:
- (a) culturing test cells or tissues;
- 40 (b) administering a compound which can inhibit hSu(fu) modulated hedgehog signaling; and

(c)  whether said administering results in hedgehog mo.  phenotypic effects in the test cells.

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